

HEALTH IMPACT ASSESSMENT OF INDOOR AIR POLLUTION FROM COMBUSTION SOURCES IN HOMES

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Background and Aims: In a large European study (HEIMTSA) and a local study (IAPAH) based in Ireland and Scotland, we developed and applied methods for estimating the health impact of indoor air pollution from combustion sources in homes. We considered two approaches: using a simple binary exposure (presence/absence of the indoor combustion source) or using exposure to $PM_{2.5}$.

Methods: Both approaches involved linking exposure estimates with demographic data, health risk functions and background rates of morbidity to estimate total health burden attributable to combustion-derived air pollution from indoor sources. IAPAH included one 24-hour measurement of $PM_{2.5}$ in each of 100 homes selected for different types of biomass fuel (wood, peat, coal, gas), or environmental tobacco smoke (ETS). Information regarding household and occupant activities was also collected. These and other published data were used to derive estimates of average annual $PM_{2.5}$ exposures, by exposure source.

Assessment of ETS used both approaches; biomass combustion used exposure to $PM_{2.5}$ only. Risk functions in $PM_{2.5}$ (for ETS and biomass) were derived from relationships for outdoor air pollution, by scaling functions in background concentrations for use with personal exposures. The ETS binary approach used risks from epidemiological studies of "living with a smoker".

Results: Preliminary results suggest that (i) using binary exposures, the greatest health burden from ETS is from coronary heart disease in adults and (ii) ETS concentrations of $PM_{2.5}$ greatly exceed those from biomass fuel. Health burdens from ETS and biomass, in terms of $PM_{2.5}$, will be presented and, for ETS, compared with impacts using the binary approach.

Conclusions: Discussion will consider strengths and weaknesses of the two approaches, for burden of disease and for evaluating impacts of policies; and the public health implications of the various domestic sources, especially ETS in homes, whose estimated impact is substantial.